Fact Sheet #1 Indiana Statewide 2005 Color Orthophotography Project
Common Questions About Digital Orthophotography

The upcoming 2005 Color Orthophotography Project is an exciting activity that will benefit every community in the state. This Fact Sheet provides definitions and general facts about orthophotography, and some specific information on the 2005 Orthophotography Project.

What is Digital Orthophotography?

Digital orthophotography provides all of the visual content of a photograph while being as accurate as a map for measurements. These qualities allow for accurate:

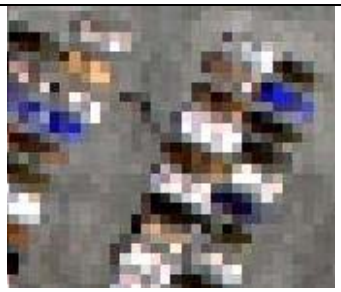
- distance measurements
- area calculations
- determination of feature shape
- direction calculations
- determination of coordinates at a given location.

Digital orthophotography is an essential basemap layer for a geographic information system (GIS). The 2005 orthophotography will be seamless within jurisdictions and across the state. Free software to view the data is available.

What is Pixel Resolution?

Digital orthophotography is a computerized image made up of "pixels" (these are similar to the dots on a television screen that make up the whole picture). Each pixel in an orthophoto represents an actual distance on the ground. Thus, 1-meter pixel resolution means each little pixel in the image covers 1 meter on the ground. As you zoom in close to an image, you start to see the pixels (like getting really close to the TV screen). The higher the resolution, the more detail you see as you zoom in closer on an image.

The 2005 orthophotography will be produced at different pixel resolutions based on county population and upgrade options (1-meter, 1-foot, and 6-inch). The following diagram demonstrates the differences in images at the three resolutions as you zoom in closer on the map.

	Orthophotography Pixel Resolution	Zoom-in	Zoom-in closer
low ↑	**1-meter** - good /medium resolution - - uses include emergency management, planning, data verification and updates, large-scale analysis, change detection - - smaller file sizes -		
	1-foot - high resolution - - uses include emergency management, parcel and utility mapping, data verification and updates - - larger file sizes -		
↓ high	**6-inch** - very high resolution - - uses include detailed project-level infrastructure mapping - - largest file sizes -		

What Is Accuracy? Why Is It Important?

Accuracy describes how close a point on the map is located compared to the actual location of that point on the ground. This is very important for properly locating features on the ground, and for overlaying or creating other accurate data in a GIS system.

The 2005 orthophotography will have the following accuracy specifications that meet or exceed well accepted standards for accuracy:

Pixel Resolution (Ground Sample Distance)	NSSDA Horizontal RMSE Accuracy (95% of points)
1-meter pixel	± 33.3 feet or better
1-foot pixel	± 5 feet or better
6-inch pixel	± 2.5 feet or better

What Is A Digital Elevation Model (DEM)? How Is It Used?

A DEM is a model of the earth's surface which is used to remove distortions in the aerial photography caused by changes in land elevation (valleys and ridges). The DEM allows photography taken of a 3-dimensional surface to be rectified to an accurate 2-dimensional photo-map. The DEM used for ortho-rectification of the 2005 orthophotography will be delivered as part of the project.

What's the Difference Between Black-and-White, Color, and Color Infrared Orthophotography?

Orthophotography can be produced with different imagery types. The 2005 orthophotography will be produced in true color statewide.

True color imagery shows the ground conditions in colors as seen by the naked eye. Color imagery is valuable because people can more quickly and easily interpret what they are seeing on a color image than black-and-white or infrared. Additionally, features appear more defined allowing people to see more features even at lower resolutions. Color works especially well in manmade environments. Color imagery produces larger file sizes compared to black and white. Fortunately, advances in file compression techniques and computer storage make color imagery within the grasp of common users.

Black-and-white imagery (sometimes referred to as grey-scale or "panchromatic") is the traditional film type people are most used to seeing for orthophotograpy. The 1-meter statewide orthophotography produced in 1998 were black-and-white (1998 b/w, and 2003 color, 1-meter orthophotos are available for download free of charge from http://www.indiana.edu/~gisdata/). Black-and-white imagery is generally less expensive and requires about 1/3 the file storage capacity of true color imagery.

Color infrared imagery is sensitive to green, red, and near-infrared portions of the light spectrum. As such, the colors on the imagery appear un-natural, but they show information about vegetation health, water and water content, impervious surfaces for water runoff, and other information not visible to the eye. Grey-scale images can be produced from color infrared imagery. Color infrared is not a base product of the 2005 Orthophotography Project, but might be included as an optional product (to be determined during project contract negotiations).

How Is Orthophotography Used?

Orthophotography is part of the basemap in a geographic information system (GIS). It is used like a photograph as a visual reference, and since it has the qualities of a map it is used to generate other important mapping data. Current, high quality mapping is an important part of emergency planning, preparedness, mitigation, response, and recovery. Law enforcement can use it for mapping trends, thereby improving performance, and public health agencies can use it for syndromic surveillance. And because the basemap is shared with other local, state and federal agencies, the GIS systems can be used for other applications as well, such as property management, Census, tax assessment, flood mapping, planning, and economic development. By having different agencies reference the same basemap, data developed independently can "fit together."

When Will the 2005 Orthophotography Be Available?

Orthophotography collection, processing and delivery can be a lengthy process. The 2005 Orthophotography Program will be on a very aggressive 12 month delivery schedule – one of the most ambitious schedules in the country for a statewide, multi-resolution project.

How Do I Get More Information?

More information on the 2005 Orthophotography Program is posted on the Indiana GIS Initiative web site www.in.gov/ingisi/ortho.